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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,733	06/30/2003	Laura J. Henderson Lewis	BSA 03-09	7685

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BROOKHAVEN SCIENCE ASSOCIATES/  
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EXAMINER

DOERRLER, WILLIAM CHARLES

ART UNIT	PAPER NUMBER
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3744

DATE MAILED: 12/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/608,733

Applicant(s)

LEWIS, LAURA J. HENDERSON

Examiner

William C Doerrler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,10-15 and 17-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10-15 and 17-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3-8,10-15 and 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sahashi et al '072 in view of Gschneidner et al.

Sahashi et al disclose applicant's basic inventive concept, a magnetocaloric material encapsulated in Ni, Co or Fe (see column 10 lines 55-69), substantially as claimed with the exception of using  $Gd_5(Si_{1-x}Ge_x)_4$  as the magnetocaloric material. Gschneidner et al show this feature to be old in the magnetic cooling art. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Gschneidner to modify the magnetic cooling system of Sahashi et al by using  $Gd_5(Si_{1-x}Ge_x)_4$  as the magnetocaloric material to provide a cooling system which can provide a high degree of cooling using a relatively small magnetic field. Sahashi et al '072 give powder dimensions on lines 63 and 64 of column 5. Since Gschneidner et al teaches the magnetocaloric material to be highly effective, one of ordinary skill in the art would be led to use it in the system of Sahashi et al. This leads to  $Gd_5(Si_{1-x}Ge_x)_4$  being encapsulated in Ni, Co or Fe. Since this is the same structure applicant is claiming, all properties are seen to be inherent. The enhancing of the magnetocaloric effect by limiting expansion will likewise inherently occur when one is led from the teaching of

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Gshneidner et al to replace the magnetocaloric material of Sahashi et al with  $\text{Gd}_5(\text{Si}_{1-x}\text{Ge}_x)_4$  to improve the magnetocaloric effect.

### ***Response to Arguments***

Applicant's arguments filed 11-5-2004 have been fully considered but they are not persuasive. It is not argued that Sahashi et al do not disclose the restricting of volume changes of the magnetic material. Sahashi et al does, however, teach the encapsulating of magnetocaloric materials, which will inherently restrict volume changes. Gschneider does not stress the importance of a single phase material in the passage cited, but rather states that for the tests described, single phase materials were used. Column 6 of Gschneider et al, beginning in line 44 state that  $\text{Gd}_5(\text{Si}_{1-x}\text{Ge}_x)_4$  is "significantly more efficient and useful than existing magnetic refrigerants". This statement would lead one of ordinary skill in the art to try  $\text{Gd}_5(\text{Si}_{1-x}\text{Ge}_x)_4$  in any magnetic cooling system, including that of Sahashi et al to provide a more efficient cooling system. While neither patent discusses the restriction of volume, the volume of the material will be inherently restricted in the system of Sahashi et al. When combined with the teaching of Gshneidner et al this leads to a structure comprising  $\text{Gd}_5(\text{Si}_{1-x}\text{Ge}_x)_4$  which is encapsulated in Ni, Co or Fe which will inherently restrict expansion. The declaration of the inventor has been considered. The declaration does not give a reason why one of ordinary skill in the art would not be led to use  $\text{Gd}_5(\text{Si}_{1-x}\text{Ge}_x)_4$  in the system of Sahasi et al to make the system "significantly more efficient and useful" as taught by Gschneider et al or why this combination would not possess the volume

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restricting properties which are seen as inherent since the coating materials are the same (in the current claims and Sahashi et al).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel can be reached on (571) 272-4808. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William C Doerrler  
Primary Examiner  
Art Unit 3744

WCD